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AUTHOR DeGroff, Linda
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ABSTRACT

It is argued that if whole language teachers are to use computers in their reading and writing programs, they will need both software and strategies for using computers that are consistent with their beliefs and goals. For whole language teachers, as for other good teachers, it is the teacher's beliefs about curriculum and instruction rather than the technology that will determine the role of the computer in the classroom. This paper explores the place of computers in whole language classrooms by considering how computers can facilitate teaching and learning in ways that are consistent with each of the following beliefs commonly held by whole language teachers: (1) children learn language through social interaction; (2) children learn by reading and writing whole and meaningful texts; (3) language is used for real purposes and with real audiences; (4) children learn when we emphasize process; (5) children need time and choices for language learning; and (6) language learning involves risk-taking. (25 references) (GL)

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COMPUTERS IN THE WHOLE LANGUAGE CLASSROOM

Linda DeGroff
University of Georgia
125 Aderhold
Athens, GA 30602

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COMPUTERS IN WHOLE LANGUAGE CLASSROOMS

Are you a whole language teacher? Or are you interested in adopting whole language practices in your classroom? When you think of computers in the classroom, does drill and practice come to mind first? Does cold technology seem inconsistent with your child-centered point of view? If you answered yes to these questions, you may have wondered, "Is there really a place for computers in my whole language classroom?"

Earlier thinking on computers in education focused on how computers might revolutionize instruction (Papert, 1980). We looked for hardware and software to create the electronic curriculum that would supplement or replace existing instructional programs in reading and language arts. We hoped or feared that computers would do our teaching for us.

More recent thinking suggests that the revolution may not be happening, or at least not in the ways that we first predicted (Mehan, 1989). Instead, we are returning to examine our beliefs about teaching, our beliefs about how children learn, and asking, "How can computers facilitate teaching and learning in ways that are consistent with our existing beliefs and goals?" Teachers and children are taking control of their classrooms and asking the computer to serve. From this perspective, it is possible to reconsider the place of computers in our classrooms.

An increasing number of teachers are finding answers to questions of how to teach and how children learn in whole language theories and practices (Goodman, 1986). If whole language teachers are to use computers in their reading and writing programs, they will need both software and ways for using computers that are consistent with their beliefs and goals. For whole language teachers, as for other good teachers, it is the teacher's beliefs about curriculum and instruction rather than the technology that will determine the role of the computer in the classroom.

The purpose of this paper is to explore the place of computers in whole language classrooms. To do this, I have selected the following beliefs commonly held by whole language teachers and considered how computers can facilitate teaching and learning in ways that are consistent with these beliefs.

- * Children learn language through social interaction.
- * Children learn by reading and writing whole and meaningful texts.
- * Language is used for real purposes and with real audiences.
- * Children learn when we emphasize processes.
- * Children need time and choices for language learning.

* Language learning involves risk-taking.

Children learn language through social interaction

Whole language theories and practices have been greatly influenced by the work of Vygotsky (1962) who explained how children's language learning begins with social interaction. If whole language teachers believe that children must interact with each other and with more capable adults in order to learn to read, write, speak, and listen, then teachers will want to know how computers can facilitate such interaction (Weir, 1989).

Recent investigations have illustrated the rich social interactions that occur when children use computers (Cochran-Smith, Kahn, & Paris, 1988; Daiute, 1983; Dickinson, 1986; Laboratory of Comparative Human Cognition, 1989). Interaction around computers happens in diverse instructional contexts. Children talk to each other during language arts lessons (Dickinson, 1986) and during Logo programming lessons (Genishi, 1988). The nature and frequency of interaction depends less on the software being used than on the ways in which teachers encourage or allow children to work with computers.

Forming new participant structures, pairs of children working together at one computer, is one way to increase interaction (Mehan, 1989). Sometimes pairs are necessary when access to computers is limited; at other times, pairs are voluntary and self-selected. In either case, when children work in pairs at the computer, learning through interaction seems inevitable.

The upright, larger-than-paper, and sometimes colorful computer screen also has been shown to stimulate interaction (Silvern, 1988). As Cochran-Smith et al. (1988) explain, "The public screen is apparently irresistible" (p. 64). As children and teachers pass by the screen or wait for turns, they talk spontaneously about writing and graphics displayed on computer screens (Bruce, Michaels, & Watson-Gegeo, 1985). Public printer terminals also provide similar opportunities for learning through interaction.

Children learn by reading and writing whole and meaningful texts

We all know how good computers can be at spitting out multiple choice questions, informing us in microseconds of our errors, branching us to remedial instruction, then giving us a second chance to respond correctly, and finally rewarding us with a beep or a blink when we get the answer right. This image of the computer may not appeal to whole language teachers, but this is not all that computers offer.

Computers also can be a medium for reading whole and meaningful texts. Children read instructions and messages from the computer (Genishi, McCollum, & Strand, 1985). Some computer

games provide opportunities for children to read and follow directions in meaningful contexts (Costanzo, 1985). And children can also read stories and informational literature at the computer (Leu, 1988).

In addition, computers offer opportunities for children to write whole and meaningful texts. Anything that children can write with pencil and paper can be written with computers. Even the youngest children have been successful at using word processors for writing personal narratives and imaginative stories (Phenix & Hannan, 1984). And word processing software is available for writers of all ages: for example, FirstWriter or Primary Editor for primary grade students; Bank Street Writer or QUILL for intermediate grade students.

In other whole language classrooms, children have organized notes and data for writing reports with database software such as QuickFile or Appleworks (Newman, 1986b, 1989). And they have shared stories and news when computers in different classrooms and schools were linked by networks or electronic mail systems such as QUILL (Bruce et al., 1985; Mehan, 1989; Newman, 1986a).

Children's published writings are an important part of the reading materials in whole language classrooms. Printers, networks, and electronic mail help whole language teachers make children's writings available as texts for readers. Computers help teachers and children make connections between reading and writing.

Language is used for real purposes and with real audiences

In the world outside of school, we seldom read to answer comprehension questions or copy other writers' sentences in order to practice punctuating. Instead we read to have our emotions stirred, to be entertained, to learn about other people and how they live, or to acquire information. We write to express our thoughts and organize our lives, or we write to communicate, entertain, and inform friends, colleagues, or distant readers. In whole language classrooms, reading and writing are done for these real-world purposes and audiences.

Computers facilitate reading and writing for real purposes when they involve the whole and meaningful texts discussed in the preceding section. When students print copies of their stories and share them with peers, they use written language to entertain or inform real audiences. When they send news reports, letters, and messages via networks and electronic mail to near or distant classrooms, they use written language to communicate with real audiences.

In addition to opportunities for purposeful writing, the experience of learning how to use computers provides opportunities for purposeful oral language. Genishi (1988) observed pairs of kindergarten children as they learned to use Logo, a programming language. She found that children's talk

focused on their tasks. The audiences for their talk were each other rather than the computer or the teacher. And their talk was cooperative rather than argumentative. As Genishi points out, if the school's goal is to have quiet classrooms, Logo may be inconsistent with those goals. On the other hand, if teachers believe that actively using language in purposeful situations is important for language development, then using computers may help teachers reach their goals.

Children learn when we emphasize processes

The idea of a process approach to teaching and learning has been most prominent in writing instruction (Calkins, 1986; Graves, 1983). In process-approach classrooms, children learn to write by actively engaging in writing whole and meaningful texts. Children select their own topics, write drafts, interact in conferences, revise, edit, and publish their work for real audiences.

Word processors offer many functions that have the power to facilitate writing processes. With word processors, writers can easily revise and edit their drafts. Whole sections of writing can be moved for large-scale reorganization, and other sections can be added or deleted. Wording, spelling, punctuation, for example, are easily edited. Saving a sequence of drafts as separate files makes it possible to compare drafts in conferences. The ability to mail or print copies of drafts gives writers the opportunity to receive responses to their work that may aid revision. Mailing and printing options also facilitate publishing.

At present, we understand very little about the effects of using these word processing functions on individual elementary school children's writing processes. A larger, more important understanding, however, is becoming increasingly clear: It is teachers' beliefs about writing and writing with computers, rather than the technology itself, that makes a difference in how instruction proceeds.

Mehan (1989) examined how computers were used in four classrooms from grades two to six. Before the research began, the teachers were already teaching writing as a process. When computers were made available to the teachers to use in their classrooms, the teachers used the computers to help them reach existing goals for their writing process classrooms. The teachers taught writing, not computing, and they taught in ways that were consistent with their established beliefs about teaching and learning to write.

In another study of the ways that computers were used in writing instruction, Cochran-Smith et al. (1988) observed writing with word processors in nine classrooms from kindergarten to fourth grade. The researchers concluded that teachers taught writing with word processors in ways that were consistent with how they generally taught writing. When teachers had an

understanding of the recursive nature of writing processes, this understanding was reflected in how they taught writing with word processors. Children wrote with word processors, moving between drafting, conferring, and revising, based on their needs rather than on a step-by-step schedule set by either the teacher or the computer.

The findings of these studies should be good news for teachers who are already emphasizing processes in their writing instruction. For these teachers, the most important elements for good instruction are already in place. Writing-process teachers' beliefs will guide their practices; computers help them achieve their goals.

Children need time and choices for language learning

For years, researchers have observed children learning to speak and comprehend their native languages (Genishi & Dyson, 1984). From these observations, we now know that children learn language at varying rates. We also know that the sequence of language learning is similar but not identical for all children. Children construct understandings of their native languages by choosing what to learn and working on it at their own paces. They do this without instruction and without adults (or machines) telling them what to learn next or how quickly they should work.

Whole language teachers understand children's need for time and choice in language learning. If whole language teachers are to use computers in their classrooms, they need assurances that it will be the children, rather than the computer, who will be controlling time and choice.

Notice that the software mentioned so far in this article has not been the drill and practice variety that in the worst cases can take control of time and choice away from children. Instead, most of the software mentioned has been from the group of software usually referred to as "tools" - word processing software, database software, networking systems, and electronic mailing software.

When we give children computer tools for language learning, the children determine what to read and write, and they set their own paces. For example, when children write with word processors, the machine sits as patiently as a pile of blank sheets of paper. The child determines what to write on the paper and how quickly to write and rewrite. When children use database software, the computer resembles a vast empty file cabinet, waiting for the child to fill it with information. When the child is ready, he or she returns to reorganize or to retrieve only that information which is important to current work. Networking systems and electronic mail programs serve the way telephones and the postal system do. Children choose what to read or write and do so for as often or as long as is necessary.

This is not to say that time is never a constraint when children use computers. At a recent workshop on using computers in whole language classroom (DeGroff, 1989), teachers were asked if they were using computers and if not, why not? A chorus of voices replied, "We don't have enough access to computers." When access to computers is limited, children do not have ample time for language learning with computers.

The 1986 report of the National Assessment of Educational Progress states that only twenty-five percent of third-grade students have ever used a computer in reading and language arts (LaPointe & Martinez, 1988). The report concludes that access to computers is a serious problem in our schools. What can whole language teachers do to give children time for language learning with computers when access is limited?

One temporary solution is to treat limited access to computers in the same way that limited time for reading and language arts is treated. For example, Calkins (1986) suggests that when teachers have limited time for writing workshops, they should cluster their time. Rather than hold writing workshop once a week throughout the year, hold it every day for a part of the year. The total amount of time remains the same, but the time for thinking, learning, and writing is ample within the cluster. By clustering computer time into a few weeks or months, children can write knowing that they can use the word processor. Or by clustering during the time that children are working on science reports, they can rely on an available computer for organizing information in a database.

How do teachers get clusters of time? They bargain for it. If a teacher or a group of whole language teachers within a school would normally get a computer for the classroom one day a week, the teachers each would have the computer for one-fifth of the school year. The teachers bargain to have the computer for 8 weeks in a row rather than forty Fridays throughout the year.

But clustering time is only a temporary solution. We must use evidence of demonstrated successes with computers in whole language classrooms to bargain for more computers. The goal should be a level of access that assures all students of time for learning throughout the year.

Language learning involves risk-taking

Observations of young children have also shown us that risk-taking is essential to language learning (Goodman, 1986). Children learn by trying out their developing understandings of how language works. When they stretch to reach new levels of competence, they learn from both their successes and errors. This is also true of language learning in classrooms. If elementary school children are to grow as language users, they must be encouraged and supported as risk-takers (Allen & Mason, 1989).

Much of the drill and practice software available for elementary classrooms is designed to identify children's errors. But this is not the case with the software tools. For example, when children write with word processors, the computer accepts their invented spellings or less-than-conventional punctuation. The children, not the computer, identify aspects of writing that are within their capacity to change. When the children understand that change is easy with the word processor, they are more willing to take chances with their writing (Phenix & Hannan, 1984). Taking chances and making changes are no longer synonymous with the dreaded recopying of an entire piece of writing.

Conclusion

Is there a place for computers in whole language classrooms? Yes. And that place is best defined by whole language teachers' beliefs and practices. When teachers plan to use computers in their reading and writing programs, they begin with their sound understandings of how to teach and how children learn. From there, teachers select software that supports their goals and facilitates teaching and learning. Teachers teach, children learn, and the computer serves as a tool for teaching and learning.

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